Vol. XI No. 4

The CHEMIST

MAY, 1934

Publication of The AMERICAN INSTITUTE of CHEMISTS

In This Issue

Annual Meeting

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Doctors vs. Quacks
HARVEY P. HOFFMAN

◆ ◆ ◆

Why I Became a Chemist
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The CHEMIST

Publication of

THE AMERICAN INSTITUTE OF CHEMISTS, INC.

ALAN PORTER LEE, F.A.I.C., *Editor*, 233 Broadway, New York City

VOLUME XI MAY, 1934 NUMBER 4

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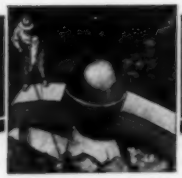

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1. Shepherd, Rankin & Wright, Ind. Eng. Chem. Vol. 3: Page 211 (1911).
2. Bogue, Anal. Ed. Ind. Eng. Chem. Vol. 1: 192 (1929).
3. Dahl, Rock Products, Volume 32, No. 23, Page 50 (1929).

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EDITORIAL

Chemical Progress and Education

IN THE course of the past few years of struggle, from which at last we seem to be emerging, if slowly, there have been many cries and lamentations to the effect that there are too many chemists. That the colleges and universities of our land have been graduating too many students tagged as chemists because they have majored in chemistry we will concede, but we wonder whether, in view of the ever-increasing prominence of chemistry, chemical products, and chemical methods in our daily lives, there really exists any surplus of qualified chemists to carry on the research, the instruction, and the production control demanded by the age in which we live.

The American Institute of Chemists is dedicated to the purpose and policy of establishing a curricular standard for the education of chemists which will insure clients and employers of qualified chemists that ability and training are available for the solution of chemical problems. The Institute does not approve any plan for the elimination of the study of chemistry as a cultural subject from any college or secondary school course. On the contrary, it heartily supports such dissemination of scientific knowledge.

We believe, however, that those who approach the profession of chemist as their life work, should be given every opportunity to obtain the most adequate preparation available. In return for these opportunities, they should be willing to submit to reasonable examination and inquiry, at intervals from the beginning to the completion of their studies, into their fitness and capacity for their chosen profession. No less and no more is demanded of aspirants for practice of the legal or medical professions and we believe it readily demonstrable that the profession of chemist touches upon the welfare, safety, and health of humanity in as many ways as do these other professions.

To cite only a few examples; the analyst employed by a steel mill might, by exceptional care and accuracy, avoid the possible ultimate failure of a steel rail or structural girder; the works chemist of a packing-house, by devising superior effluent control, may markedly reduce stream pollution, conserving aquatic life and increasing the level of

(*Turn to page 106*)

Medal of
The American Institute of Chemists

"For noteworthy and outstanding service to the science of chemistry or the profession of chemist in America."

Awarded for 1934

to

JAMES B. CONANT

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1926 William Blum
1927 Lafayette B. Mendel
1929 Mr. and Mrs. Francis Patrick Garvan
1930 George Eastman
1931 Andrew W. and Richard B. Mellon
1932 Charles H. Herty
1933 Henry C. Sherman

Conant Receives Institute Medal

Presentation made at Chemists' Club before brilliant assemblage including many college presidents, members, and guests of the Institute.

AFTER a dinner held at The Chemists' Club, New York, on Monday, May twenty-first, the evening of the Institute's Annual Meeting, the Institute's gold medal for "*noteworthy and outstanding service to the science of chemistry or the profession of chemist in America,*" was presented to James Bryant Conant, Ph.D., LL.D., President of Harvard University.

A large gathering of Fellows, Associates, and members of the Institute and their guests, including many ladies, was present to honor the Institute's newest medalist. In accepting the medal, Dr. Conant thanked the Institute and expressed regret that his duties as head of Harvard probably would prevent his engaging in further intensive chemical research in the future.

Frederick E. Breithut, F.A.I.C., Past President of the Institute, presided at the meeting, being introduced by M. L. Crossley, F.A.I.C., President. The first address of the evening was made by Henry G. Knight, F.A.I.C., retiring President, who spoke briefly on the aims and ideals of the Institute and the purpose of the medal award. "In honoring a man like Dr. Conant," said Dr. Knight, "we honor ourselves."

Dr. John H. Finley, of "The New York Times," delivered an address, praising the science of chemistry as a contributor to material progress and suggesting that science may have a similar contribution to culture, helping the world to understand the romance of material things and to interpret physical elements in terms of the spirit.

Hans Thacher Clarke, F.A.I.C., of The College of Physicians and Surgeons, Columbia University, long a friend and associate of Dr. Conant, made the presentation address, tracing the career of Harvard's president from his matriculation at the university in 1910 until his appointment as its President last year.

In acceptance of the medal, Dr. Conant made a few extemporaneous remarks, in which he pleaded for cooperation of scientists in research work, particularly on the chemistry of plant physiology and pathology, a field hitherto little investigated. He believes, he said, that "the best research is done by men who make it fun and work together."

The evening's addresses will appear in later issues of THE CHEMIST.

Institute Annual Meeting

Twelfth National Gathering held at New York on May twenty-first. M. L. Crossley elected president. Conant of Harvard honored as Medalist.

ON Monday, May twenty-first, the Twelfth Annual Meeting of The American Institute of Chemists convened at The Chemists' Club, New York City, at three P. M. The Annual Meeting was preceded by a Council Meeting which is reported elsewhere.

President Henry G. Knight presided at the Annual Meeting which was attended by a representative and enthusiastic body of the membership. The first order of business included reports of the Secretary, Howard S. Neiman and the Treasurer, D. P. Morgan, followed by report of the Auditing Committee in substantiation of the Treasurer's report. These reports were accepted and approved by the Meeting.

Vice-President M. L. Crossley submitted report of the Committee on Professional Education. The Secretary presented an oral report outlining the method of procedure employed by the Committee on Qualifications in passing on applications for Membership and Fellowship.

Walter J. Baëza, of the New York Chapter, offered the report of the Committee on Licensing of Chemists. This report included an outline of the proposed legislation to be submitted in New York State for the licensing of chemists. The report elicited spirited discussion by the members present, at the conclusion of which the report was accepted by the Meeting. In the absence of the Chairman, Lloyd Van Doren, report of the Committee on Constitutional Revision was read by President Knight and was acccepted by the Meeting. Report of the Committee on Group Insurance was submitted by Dr. Crossley and received by the Meeting. The Editor of THE CHEMIST submitted a verbal report covering future plans for the publication.

Chapter Reports were received from the New York, Pennsylvania, and Washington Chapters, which chapters were congratulated by the President for their fine work during the past year.

A suggestion submitted to the Meeting in reference to adoption of a method of election of Fellows and Associates from the ranks of qualified chemists before submission of applications was referred, upon adopted motion, to the National Council.

The following amendments to the Constitution were approved by the Meeting:

Article II

Section 1. The membership of the Institute shall consist of (1) Honorary Members, (2) *Life Members*, (3) Fellows, (4) Associates, (5) Juniors, (6) Student Members.

Article III

Change Article III, Section 2, to 2-*a*. Insert the following: *Section 2-b. The officers, excepting the secretary, and the nine directors or councilors at large, shall not be eligible to serve more than two successive terms in the same office or capacity.*

Cancel Section 5. "Ex-presidents of the Institute shall be ex-officio members of the Council," and substitute: *Section 5. The two immediately preceding past presidents of the Institute shall be ex-officio members of the Council.*

After discussion of the subject of rebates of a percentage of dues from the Council to Chapters, the Meeting voted that the National Council study the question of increasing the amounts of such rebates and present its findings to the Chapters before November first.

The following resolution was adopted:

Resolved, That The American Institute of Chemists, Inc., at the Annual Meeting held on May 21, 1934, does hereby accept, confirm, and affirm all the acts of the National Council in behalf of The American Institute of Chemists, Inc., during the year ending April 30, 1934, as published in THE CHEMIST.

The Meeting voted that the Council be requested to give consideration to forming a new class of membership to be known as contributing membership.

The President announced the election of the following officers and councilors for the coming term: *President*, M. L. Crossley; *Vice-President*, Arthur J. Hill; *Secretary*, Howard S. Neiman; *Treasurer*, Alan Porter Lee; *Councilors*, Ross A. Baker, Walter T. Taggart, and Frederick W. Zons.

The newly elected President, Dr. Crossley, assumed the Chair. The Meeting voted unanimously that a Vote of Thanks of the Institute be extended to the retiring officers for their faithful service. There being no further business, the Meeting was adjourned.

Water Pollution

By M. Starr Nichols, F.A.I.C.

IF ALL the waste waters in United States carrying sewage and refuse of all kinds were combined into a single channel, the continuous flow would equal the mean average flow of the Colorado River at Boulder Dam. This vast volume of waste is constantly polluting our inland and tidal waters. The prevalent idea that water purifies itself in a short period has been found to be only partially true even with mildly polluted waters. Riparian law in general is construed to mean that no water may be taken from a body of water to be used and returned in a polluted condition; but on account of the sparsity of industry and the plenteous supply of comparatively pure waters these riparian rights are often invaded. Industry must have water, and industry must of necessity dispose of its wastes.

Chemists have made extended studies on methods for the evaluation of the pollution strength of the wastes of civilization. As a matter of seemingly first importance, domestic sewage has received a large amount of attention in their studies. Notwithstanding the importance of sewage as a polluting factor of natural waters, trade wastes of sundry industries have been found to be equally potent in causing pollution.

Wastes pollute waters generally in two distinct ways. In some cases the waste materials reduce the dissolved oxygen content to such a point that anaerobic putrescible waters obtain. On the other hand the deposition of solid material causes clogged channel-ways and floating sludge produced through anaerobic decomposition of the deposited organic matter. In isolated special instances metallic wastes poison the waters receiving them. In addition to these rather common effects of pollution, water supply sources become frequently polluted by waste bearing pathogenic bacteria. Surface water treatment by coagulation, filtration, and sterilization has become the necessity with all these natural waters.

As industry and population increase, so will water pollution. In the past, industry was only concerned with its water supply; but it is now becoming increasingly concerned with its waste disposal. In some cases an industry has so polluted a stream that a sister industry located below on the same stream is unable to utilize the water in its manufacturing processes.

A paper mill locating on a stream some sixty miles above a city in an eastern state added a waste to the stream water so that the original

two grains of alum per gallon needed to treat the stream water for domestic use had to be increased to six grains per gallon to reduce the organic color.

GOVERNMENT and state agencies are constantly at work determining the extent of natural water pollution, fixing responsibility for pollution, and aiding industry and municipality in solving their pollution problems. Often it is found possible to utilize waste materials to defray costs, partially or completely, and even sometimes to make the products of recovery pay a profit in addition. In the paper industry this has solved some of the major pollution problems. In a brass industry in Connecticut some years ago a handsome profit was made by electrolyzing the wastes.

Only about one-half of the wood used in paper-making gets to the paper stage. The cooking liquors carry away the other one-half. In the sulphate process the liquor is processed for the recovery of the spent chemicals but no satisfactory process has yet been devised to utilize economically the sulphite waste liquor. The use of this liquor as a binder in briquetting of coal has shown promise of a use only in a small way.

In domestic sewage treatment the sale of sludge for fertilizer has been found profitable. Milwaukee in normal times sells its fertilizer to produce sufficient income to pay for its preparation and has thus solved its sludge disposal problem. Gas from sludge digestion has a high B. T. U. and is utilized at a number of places for heating purposes. At Springfield, Illinois, it is used in power generation by driving a gas engine.

Water pollution is measured by the amount of organic and inorganic material which it carries and the state in which these materials exist, and the degree of saturation with dissolved oxygen. In some cases natural waters which are partially or badly polluted are examined to determine the degree of pollution by finding their biochemical oxygen demand. When the rate of biochemical oxygen demand exceeds the absorption of oxygen from the air, the water becomes rapidly depleted of its natural oxygen. The oxidative decomposition of organic waste materials always is accompanied by bacterial action producing carbon dioxide, ammonia, nitrites, and nitrates, and a residual humus-like material which resists biological action and is usually deposited as sludge in the water bed.

The water pollution chemist endeavors to determine water pollution indices for the wastes entering the natural bodies of waters and to devise means applicable for the reduction of the amounts of these materials

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Doctors versus Quacks*

By Harvey P. Hoffman, M.D.

Reviewing the history of Medical Societies and registration of practicing physicians and surgeons in the United States and more particularly in New York State.

PRIMITIVE, or ancient, medicine is the expression of a philosophy that grows from the natural reactions of all ignorant men placed in hazardous surroundings. In the early days, long before civilization had developed, savage man was not, as some people believe, a carefree creature living a free and idealistic life in the midst of an abundant Eden. Instead, this ancient ancestor of ours was a terror-driven, ignorant savage facing a hostile world. Even as he crouched and shivered in a world to which he was ill-suited physically, he sought an explanation for his plight. He was ignorant, yet intelligent. The mere fact that he developed mysteries established him as man, for no other animal has ever had the intelligence to reason on abstract matters. Some individuals among the savages of the tribe were shrewder, cleverer men than the rest; or perhaps they were not quite so normal as the others, a little queer. At any rate they were not well understood by the others, who came to believe that they had power over the spirits, the mysterious forces that sent the sunshine and the rain, that brought game to the hunter and gave success in combat. Such a man was the one, then, to whom the others turned for relief from the spirits that brought disease. He was the medicine man. Unfortunately, but logically, these earliest physicians were expected not only to heal their friends but to cast sickness upon their enemies as well. They practiced what we should call both white magic (healing magic) and black magic (destructive magic).

In the United States we had the early practice of medicine in the New England States, and the small community found the doctor traveling about on foot; and in the South, among the larger plantations, the doctor went around on horseback. Two hundred years ago there were not many doctors in the United States and those who were practicing

* Presented at the Symposium on Licensing, of the Niagara Chapter, American Institute of Chemists, Niagara Falls, N. Y., March 10, 1934.

medicine had English training. We also find that quackery existed during the time of Washington. The history goes that Patsy Custis, a stepdaughter of Washington, was treated with an iron ring to overcome attacks of fits. For this treatment Washington paid ten shillings. About the time of the death of Washington, the better physicians of America began to organize into groups of societies. We find that in the State of New York a law to regulate the practice of medicine and surgery was passed on March 23, 1797, by the legislature. The provisions of this act proved ineffective to correct the turbulent conditions then existing in the field of medicine.

Following a gathering of physicians in Saratoga, New York, a law was passed by the legislature on April 4, 1806, entitled, "An Act to Incorporate Medical Societies for the Purpose of Regulating the Practice of Physic and Surgery in this State." It is declared that this act "was the first legislative recognition of a medical society in the United States." On September 8, 1883, Dr. Henry R. Hopkins became chairman of a committee to promote the much needed legislation for a bill to regulate the practice of medicine. On June 8, 1891, this bill was introduced in the legislature by the Medical Society of the State of New York after innumerable delays and became effective as a law in September, 1891. By this act the control of the practice of medicine, which had lapsed from the state many years before, was not reclaimed.

THE practice of medicine is defined thus: A person practices medicine when he holds himself out as being able to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity, or physical condition, and who shall either offer or undertake, by any means or method to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity, or physical condition. No person shall practice medicine, unless registered and legally authorized prior to September 1, 1891, or unless he is licensed by the Regents and registered under Article 8, Chapter 661, or the law of 1893.

The State Board of Medical Examiners is composed of nine members appointed by the Regents who hold office for three years from August 1st, of the appointment. The Regents appoint one-third each year. No person shall be appointed a member of the Board of Medical Examiners who is not eligible to receive a license from the Regents under the laws of 1893, and acts amendatory thereto. The Regents may remove any member of the Board of Medical Examiners for misconduct, incapability, or neglect of duty. The qualifications required for admission to the examination are: that the person be twenty-one

years of age or over, have an education of at least two years of college work and four years in a recognized institution, and that he be of good moral character. The admission fee is $25.00. When one receives his license, it must be registered in the county clerk's office in the county where the physician wishes to practice. The physicians exempt from this ruling are those commissioned in the service of the United States Army and Navy, Public Health physicians working under prescribed duties and consultations, as along the border, and emergency treatment. On May 17, 1926, the law was amended by the provisions of the new sections to curb the practice of medicine by cults, to regulate the use of the title "Doctor," and to require the annual registration of physicians engaged in the practice in the state. This legislation was known as the Webb-Loomis bill and met with bitter and wide-spread opposition. At that time some two hundred persons in Buffalo and about two thousand in the state, were using the title "Doctor" illegally. The yearly registration was $1.00; however, it is now $2.00. A list of all the registered physicians legally eligible to practice medicine in the state is mailed to the members. The yearly registration license must be conspicuously displayed in each physician's office.

MEANWHILE, Governor Alfred E. Smith had sent a message to the legislature which read in part: "This bill if enacted into law will not stop anyone from plying any occupation involving the public health who could legally do so before its enactment into law. That means that it does not restrict the existing rights of any individual or any group. It will afford opportunity through a grievance committee for the profession to clean its own house. It will protect the public from the exploitations of quacks and charlatans by regulating the use of the title 'Doctor' and by the prevention of fraudulent and deceptive advertising."

The law has not fulfilled all the promises made by its sponsors, but it has been a step in advance, and in time probably will be further amended. It has permitted the licensing of physiotherapists, who formerly were chiropractors, but only about four hundred received licenses, although twelve hundred applied. The physiotherapist is supposed to work under the direction of a physician, and only a few who formerly were nurses do so. The importance of the Practice Act to the community can be shown by the fact that it drove many of the inferior medical colleges from issuing diplomas, a condition known as "diploma mills." In the city of Chicago alone there were fourteen medical colleges. Three of these would be classed A or colleges eligible to give diplomas, and others were diploma mills, such as, chiropractic

and naturopathic schools, night schools, and two- and three-year medical schools. This condition was also found in St. Louis, Missouri. You no doubt recall of the notoriety of the diploma mills of St. Louis and the men having these diplomas in all parts of the United States. A license to practice is not detrimental to the interests of the community as it has the advantage of protection and encourages the individual to be brought to higher ideals and principles. The medical profession is proud of what the state and community has done for it and is jealous of its rights and privileges. We note that when the state of New York removed the title of "Doctor" from the quacks, quackery practically lost all its charm. When the charlatan could use the title of "Doctor," it raised his esteem and standard in the community and helped him sell his quackery to the masses. But when he had to use the plain "Mr." or "Chiropractor Jones," his business began to fall off and he fought desperately to receive some type of license.

The title of "Doctor" is not to give one carte blanche to carry on any and all types of medicine and surgery, but it was found after registration that practically all the doctors were law-abiding citizens and cooperated with the state and community to fulfill the fundamental principles to the right practice of medicine and to carry out the laws to the best of their ability. The doctor has no fear for the present Law Grievance Committee, it is only the chiseler and illegal practitioner who has these fears.

In conclusion we find that it was through the Medical Practice Act as amended in 1926—by freely publishing the names of the legally registered physicians in the state, and promoting the prosecution of illegal practitioners under the Attorney General's office—that the illegal practitioners were driven from the field of medicine, and quackery lost its charm. The physician and surgeon who persisted in carrying out his chiseling practice was taken out of the field by the Grievance Committee, either by having his license suspended or revoked.

WATER POLLUTION

(*Continued from page 87*)

by suitable economic treatment processes. Each type of waste offers a separate problem but the polluting capacity of many types of wastes is greatly reduced by screening, sedimentation, chemical precipitation, and biological oxidation.

The Evolution of Sewage Treatment

By Bertram D. Tallamy

A comparison of ancient, medieval, and modern methods of disposal and treatment of community wastes.

WHEN civilization began to concentrate population within limited areas, methods of removal and disposal of the noxious refuse of the community were immediately forced upon man. Explorations in the early part of the 19th century brought to light extensive arrangements in the temple at Jerusalem for the removal of the offensive matters peculiar to the sacrifices of those ancient people, and further explorations also revealed the famous trunk sewers of Rome, which were built as far back as history records. Careful planning was evidenced in their construction, as the sewers were proportioned according to the contributing population. These sewers discharged into the Adriatic Sea, thus availing themselves of the dilution method of sewage treatment, a type of treatment used extensively to this day.

Vitruvius, a writer in the time of Augustus, was one of the earliest advocates of sanitation to express himself in writing. He stressed the importance of thorough sewerage of towns, provincial cities, and even of army encampments. The ancient Greeks, also, sewered some of Athens and discharged the sewage onto the lands, an ancient example of the type of sewage treatment which is used by Paris, one of the largest cities of the world. In the middle ages, excreta, sewage, and other wastes were discharged into very large pits lined with brick and stone. These had large sludge capacities and after a long period of time the sludge turned into an earth-like substance. The overflow from these pits was discharged into moats and other available bodies of water. In reality, this method of sewage treatment is identical with treatment by septic tanks.

More recent agencies and projects which have been important in sewage treatment are largely based on the more modern sciences of chemistry and bacteriology. These sciences were first used in developing sewage treatment in England and on the Continent. The rapid industrial growths between 1800 and 1840 caused extreme pollution of the smaller water ways and attempts were made by various communities to solve the problem of stream conservation. In 1848 Rotterdam,

Holland, built part filtration and part sewage farms. In 1855, the first important sewerage system in the United States was started in Chicago. In 1860, the famous sewage farms of Paris were constructed and are still in use. Five years later the first Royal Commission was appointed to inquire into the best means of preventing stream pollution and in 1888, the Lawrence Experimental Station of Massachusetts was inaugurated. These agencies did much valuable work in connection with sewage treatment.

THE septic tank method of sewage disposal, which was introduced in England by Cameron in 1895, was thought, at that time, to be the final solution of the sludge and effluent problems. It was soon learned from the operation of these tanks, however, that the foul effluent from these tanks carried a large amount of suspended matter. This discovery led to a vast improvement in the design by the introduction of two-story septic tanks first conceived by Dr. Travis, Medical Officer of Health for Hampton, England, and by Dr. Karl Imhoff of Germany. The essential difference between the septic tank and the Travis and Imhoff tank being the separation of the sludge digestion and sedimentation compartments, in order to prevent the hindrance of sedimentation by the evolution of gas from the digestion compartment.

Many installations of the Imhoff type were built in the Emscher District near Essen, Germany, beginning in 1907. Soon after, this process of treatment was studied in America, at Philadelphia, Chicago, and Columbus. After this the number increased very rapidly and during the past ten years, American installations have many times exceeded those made in Germany.

Another important step in sewage treatment is that of separate sludge digestion, which as the name implies, is a method of digesting sewage solids in separate tanks. This treatment was first suggested at the Lawrence Experimental Station about 1899 and recommended for the City of Paterson, N. J., by Hazen in 1906, and adapted by the City of Birmingham, England, in 1912. Since that time, there have been many installations in all countries and they are rapidly gaining the favor of engineers. Many valuable experiments in separate sludge digestion have been performed by the engineering departments of cities in this country and abroad. The services of the New Jersey Experimental Station under the direction of Dr. Willem Rudolfs have been invaluable in proving the value of temperature and pH control of sludge digestion.

The development of the intermittent sand filter which consists of applying small volumes of sewage to sand beds, draining and then refilling some hours later was first established at Merthyr Tydvil, Wales, in 1871. Further investigations were carried on at Lawrence after 1888 and are responsible for the extensive use of this type of treatment throughout New England. However, the advent of the contact bed and trickling filter processes and the greater cost of the sand filter has been a serious drawback to this type of treatment. The contact bed, which is similar to the sand filter excepting that stone from $\frac{1}{2}''$ to $1''$ in size is used in place of sand, was first developed in England. Binnie, Crimp, and Dibden studied the process in 1892 and shortly after, following the construction of a plant at Barking, many installations followed in England. In this country, they rapidly developed after 1900. Contact beds were introduced in order to secure higher rates of filtration than was possible with the sand filter, and they in turn gave way to the trickling filter for the same reason.

THE trickling filter stone is still larger and the sewage is distributed evenly over the bed by spraying or similar means. The Lawrence Experimental Station laid the corner-stone for this treatment in 1889. Corbett, of Salford, England, immediately carried on large scale experiments and developed the principle of aeration by spraying and also of underdrainage. Hazen and Waring in America, also added much knowledge of this subject, together with many other investigators. This type of treatment represents one of the most important modern advances in sanitary science and now commands major consideration in the treatment of sewage of our smaller projects.

In cases where a high degree of purification is sought for larger cities, however, major consideration is doubtless given to the activated sludge process, which was originally suggested at the Lawrence Experimental Station in 1890. It was not developed, however, until 1910, when Black and Phelps showed that a substantial reduction in putrescibility could be obtained. Their experiments were continued in England by Arden and Lockett, and by Clark and Gage at Lawrence. In this process, sludge is activated by aerating sewage for a sufficient length of time to permit solid particles to become coated or impregnated with growths of oxidizing bacteria. This activated sludge is then mixed with incoming sewage and aerated from three to ten hours allowing the organic matter to become oxidized, after which the sludge is removed by sedimentation.

There are many of these installations on the Continent and in America at the present time, and nearly all of the recently constructed large

plants are of this type. There are many investigators of sewage treatment problems which have been of great service to this branch of science, who are not mentioned in this rather cursory description of the advance of sewage treatment and it is only through their talent and diligent labors, linked together with those noted, that we have made such strides forward in the necessary science. It is a branch of engineering in which much work has been accomplished and in which much is still to be learned. Just a few of the subjects now being studied at the New Jersey Experimental Station under the able direction of Dr. Willem Rudolfs are listed to illustrate that much is still to be done. These are a comparison of different trickling filter medias, thermophilic digestion, studies of enzymes during oxidation processes, studies of bacteria and protozoa in oxidation and digestive processes, effects of catalysts and molds, and direct incineration.

Why I Became a Chemist

By David Wesson, F.A.I.C.

A noted chemist recalls the days of his youth and the influences which governed his choice of profession.

IN THE year 1877, there were no high schools in Brooklyn, where I lived. The two upper classes, however, of public schools were called "collegiate classes;" and during the last two years, the boys and girls were given rather popular courses in astronomy, physiology, chemistry, chemical philosophy (physics), algebra, and geometry. We were allowed access to the supply of apparatus owned by the school, and we used to borrow it to try experiments at home. The corner drug store supplied the necessary chemicals.

My first step in chemistry was the production of hydrogen. I had read in the chemistry books about the philosopher's lamp, so I constructed one, using a pickle jar, and not having had a thistle tube, or any other kind of glass tube for an outlet, I took a white metal outlet tube from a syringe and inserted it through a hole in the cork. Scrap zinc was put in the pickle jar and the diluted acid poured over it. The cork was inserted, and the application of a match to the outlet produced

an explosion, which blew out the cork, and alarmed my family down stairs. After several attempts, I finally lighted my lamp and observed the blue flame which quickly melted down the jet from which the gas escaped. Some days after that, one of my friends and I borrowed a copper flask with a rubber tube connecting with a rubber gas bag, and a Bunsen lamp and a lamp stand. We put in some nitrate of ammonia, and started to produce nitrous oxide. With a good flame under the flask, we noticed the gas bag filling up very rapidly, and barely had time to remove the flame before there was a big explosion, which damaged the flask and carried away the rings of the lamp stand. As the other boys of the class had been using the same copper flask to make chlorine in and for other experiments, the principal of the school decided that the thing to do was to take up a collection to pay for the damage. This was a source of great relief to my friend and myself, as the country at that time was passing through a depression period.

Shortly after that, my family acquired a new milkman, and we noticed in the course of a day or two, that the milk had somewhat of a starchy taste. The application of chlorine water and iodide of potassium developed a beautiful blue coloration of iodide of starch, and we got another milkman.

My study of physiology led to an interest in medicine, and conversation with our family physician convincing me how important it was for a physician to know chemistry, I decided to lay my course in the direction of a career in medicine. With that end in view, I took a chemical course when I entered Massachusetts Institute of Technology, after leaving public school. I remember at one time talking over with my Professor of Chemistry the subject of future prospects for the young chemist. He assured me that a good analytical chemist could always earn a living but he did not hold out any great inducements on the chance of making a fortune.

IN THIS particular period, there was a great deal of interest in mines and metallurgy, so I chose the course in metallurgical chemistry. After graduating from Tech, the only immediate opening was that of Assistant Instructor, as well as private assistant to Professor Nichols, who at that time was an authority on water analysis and sanitation. A year spent with him, setting up his lectures for general chemistry and doing his analytical work was as good as a postgraduate course.

The first promising position open to me was that of analyst for a soap plant in Chicago. In my course as a student, I had made some soap analyses, and I found there was little information in the books re-

garding this branch of chemistry, so I concluded that if I went into it, I would know as much as anybody else, which was not very much. The soap factory I went into was the offshoot of a refined lard factory, and I naturally drifted into the chemistry of fats and oils, with the result that instead of carrying out my original idea of prescribing medicines, my time has been mostly devoted to the preparation of fatty foods.

Report on Group Insurance

By Charles F. Smith, F.A.I.C.

THE June, 1930, issue of THE CHEMIST contains the report of a committee appointed by the Council of The American Institute of Chemists to inquire into the feasibility of obtaining Group Insurance for the members of the Institute. The committee was forced to the conclusion that it would not be practicable for the Institute to obtain Group Insurance, whether it be for Health, Accident, or Life, and gives by way of explanation the following summary of its investigation:

"We have been in touch with every insurance company in the United States and, in order to obtain a reduction in rate, we must guarantee a minimum of 100 policies to the insurance company. Even then, the rate would be within 5% of the standard rate. In order to obtain a reasonable reduction, at least 250 policies must be taken out. This would mean that the Institute must guarantee that 50% of its membership will take out such an insurance policy, and we are not in position to do this. Furthermore, it seems that all insurance companies are unwilling to insure chemists as a group. The general conception among insurance people is that 'the Chemist is a dangerous individual, who is smoking, while sitting half asleep, on a barrel of dynamite which will go off any minute.' As Group Insurance, therefore, we could obtain insurance only at the most expensive and most hazardous rate. A large number of chemists are doing executive and office work and are not exposed to grave dangers. As individuals, we are able to obtain a lower rate than as a group, and the difference in rate between the most hazardous and the non-hazardous occupation is 50 to 100%. Your Committee begs to suggest that The American Institute of Chemists drop its effort to secure Group Insurance as being impracticable and not feasible."

The four years which have intervened since the publication of this report do not appear to have changed the situation much, judging by information recently obtained from local representatives of the larger insurance companies. Some gave as their opinion that, under the state insurance laws, only groups of fifty or more persons working for the same employer were eligible for Group Insurance and in such cases the employer would have to share the cost of life insurance. All agreed that insuring groups such as ours presented real difficulties to the insurance company, and that such insurance was of questionable advantage to the group as a whole.

GROUP life insurance is merely one-year term insurance which carries a premium representing the average of the separate premiums as computed for the individual ages. Under such a plan members who have passed the average age of the group get insurance cheaper than they could purchase term insurance as individuals, but the younger members have to pay higher rates than would apply on individual term policies at their separate ages. For a group like ours, the premium would increase each year unless we could bring in younger men to hold down the average age. The only advantage would be that insurance could be obtained without physical examination by those who could not pass such an examination.

The insurance companies object to issuing group policies for societies or lodges because it is hard to find anyone who can assume full responsibility for the payment of premiums. The treasurer might resign, or the treasury run dry, or a lot of things happen which would make difficult the collection of premiums on such a group policy. Even the payment of premiums for a year in advance does not attract the insurance companies, because the life of the contract is relatively uncertain as compared to a contract made with an established industrial concern. Then, too, societies like our own rarely insist upon new members measuring up to any such high standards of health as most industries are forced to maintain, and this means that the insurance companies would be taking increased risks. The casualty companies likewise are indifferent about writing Accident and Health Insurance for such groups as ours. Therefore, we can only conclude that even if there were no legal obstacles, Group Insurance could not easily be obtained either for our Niagara Chapter or for the Institute as a whole.

BOOK REVIEWS

Handbook of Chemistry and Physics, 18th Ed. *Chemical Rubber Publishing Co.*
Chemical Engineers' Handbook. *McGraw-Hill Book Co., Inc.*

In widely accepted belief that a technical education consists largely in knowing where to find information and, having found it, how to apply it, we have the key to the difference between the two books before us. One of them in twenty years has passed through eighteen editions. The other is first published this year.

The older book, the *Handbook of Chemistry and Physics,* consists almost entirely of tables ranging from tables of compound interest to the characteristics of thermionic tubes and new organic analytical reagents. Its growth through successive editions has been by the addition of new subjects in tabular form as well, of course, as by the revision and extension of old tables. While each addition has broadened its possible list of users, it has served also to make each new edition more valuable to those old users who have become accustomed to the handbook. This reviewer has often found it invaluable as a time-saver.

The *Chemical Engineers' Handbook* is entirely different in plan and treatment from the *Handbook of Chemistry and Physics.* Where the latter presumes possession by the user of ability to make use of the tables presented, about seventy-five per cent of the former is composed of descriptive matter. It is divided into thirty sections. The first three are exclusively tabular, sections four to twenty-five, inclusive, are concerned with unit chemical engineering processes, power applications, etc., while the remaining five sections deal with business and professional matters such as cost accounting, report writing, and patent law. Each section is compiled under the direction of an authority on its special subject matter but necessarily contains much more material on the different types of processes or equipment used to accomplish a given result, than figures and data showing performance. While the latter are probably as complete as are available, one wonders which type of material will be more useful in a handbook of this type. As a new venture in handbooks we welcome it to the field and wish it success.

David Wesson

David Wesson, F.A.I.C., Technical Director of the Southern Cotton Oil Company, died at his home in Montclair, New Jersey, on Tuesday, May twenty-second, of a heart ailment after an illness of three weeks. He was in his seventy-fourth year.

Born in Brooklyn, New York, he attended the public schools of that city and the Brooklyn Polytechnic Institute. He graduated from Massachusetts Institute of Technology in 1883. His first activity after graduation was that of assistant to Professor W. R. Nichols at his Alma Mater. He entered commercial life as chemist for the N. K. Fairbank Company, refiners of lard and manufacturers of soap in Chicago. After some years with the Fairbank Company, he became manager of the American Cotton Oil Company in New York, associated with the Fairbank Company.

In 1900 he became manager of the Technical Department of the Southern Cotton Oil Company, remaining in that association for the remainder of his life. It was at the beginning of that employment that he perfected the famous Wesson Process for refining and deodorizing edible cottonseed oil, which process was primarily responsible for the development of a large industry in edible cottonseed products.

Doctor Wesson was a member of: Sons of the American Revolution; The Chemists' Club, New York; The Cosmos Club, Washington; Montclair Athletic Club; American Chemical Society; Montclair Society of Engineers; Society of Chemical Industry; American Oil Chemists' Society, and American Institute of Chemical Engineers. He was a Past President of the American Institute of Chemical Engineers, The American Oil Chemists' Society and the Montclair Society of Engineers. He was a Fellow of The American Institute of Chemists and of the American Association for the Advancement of Science. Dr. Wesson is survived by his wife, the former Mrs. Augusta Halsey Tilden, by two daughters and two sons by his first wife, Mrs. Matilda Moore Wesson, who died in 1925, and by nine grandchildren.

The world will remember David Wesson as the inventor of a chemical process; his many friends and associates will recall him as a genial, friendly personality, liked by all; the present editor of THE CHEMIST, in common with hundreds of others, will remember David Wesson for his ready helpfulness to young chemists seeking advancement in their profession. He was never too busy for an encouraging word and a practical suggestion.

INSTITUTE NOTES

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Calco Chemical Co.,
Bound Brook, N. J.

HOWARD S. NEIMAN, *Secretary*
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New York, N. Y.

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W. T. TAGGART	W. C. MACTAVISH	A. L. MEHRING	ARTHUR W. BURWELL

National Council

April Meeting

The one-hundred and eleventh meeting of the Council of The American Institute of Chemists was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on Thursday, April 26, 1934. President Henry G. Knight presided. The following Councilors and Officers were present:

Messrs. Breyer, Morgan, Neiman, Snell, Zons, and Miss Wall.

The minutes of the previous meeting were adopted. The Treasurer reported a cash balance on hand of $136.36. The Secretary submitted an employment agreement with Mr. Alan Porter Lee as Editor of THE CHEMIST, and upon motion made and seconded, the Secretary was directed to sign the agreement. The Secretary read the report of the tellers on the nomination ballots. In the absence of Mr. Lee, the Secretary read the Editor's report relative to the present condition of THE CHEMIST, especially with respect to advertising.

Dr. Knight read a letter from Mr. A. L. Mehring, Chairman of the Washington Chapter, stating that at one of the recent meetings of the Chapter, it was voted to give medals to the students of the local universities for excellence in scholarship. It is planned at the present time to offer a bronze medal to the student majoring in chemistry with the highest average grade during his four years of college work, and a free Junior membership for one year in the Institute. There will be five of these offered each year, one for each of the five institutions in that vicinity, in the hope that the majority of those honored would con-

tinue their memberships in the Institute. This suggestion received the approbation of the Council, and upon discussion it was suggested that it would be advisable to inform the other Chapters of this suggested action upon the part of the Washington Chapter in order that similar activities might be undertaken by them, if they so desire. It was further suggested that it might be more advisable for the Institute to furnish medals in order that they might be of a uniform design, and that the respective Chapters pay the Junior membership fee for the first year. The Secretary was advised to write each of the Chapters relative to this matter and obtain their opinions and suggestions.

The following new members were elected:

FELLOWS

ROBERT JAMES FLETCHER, *Division Head*, Amalgamated Dye and Chemical Works, Inc., Newark, N. J.

WILLIAM L. HYDEN, *Research Supervisor*, Du Pont Rayon Company, Station B, Buffalo, N. Y.

ASSOCIATE

HERBERT S. SCHENKER, *Chief Chemist-Physicist*, Gimbel Brothers Bureau of Standards, Philadelphia, Pa.

STUDENT MEMBER

FREDERICK LEROY SIEVENPIPER, Student University of Buffalo, Buffalo, N. Y.

Mr. Sievenpiper has received the award of a free Student membership from the Niagara Chapter.

The Secretary reported upon his conversations with Dr. Conant, and upon motion made and seconded, the previous action to hold the annual meeting in Atlantic City on May 19, 1934, was rescinded, and it was: *Resolved*, that the annual meeting and medal award be held at The Chemists' Club, New York, N. Y., on Monday, May 21, 1934.

President Knight appointed the following Committee on Medalist Publicity, including the printing of the programs: Alan Porter Lee, Florence E. Wall, and Frederick W. Zons, and the following Committee on annual meeting, dinner, and medal award arrangements: Ross A. Baker, Frederick E. Breithut, and the Secretary as ex-officio member; the Committee being empowered to add to its membership.

New York Chapter

On Friday evening, May 11, 1934, the New York Chapter of The American Institute of Chemists held its annual business meeting at The Chemists' Club, New York, N. Y.

The meeting was called to order by Chairman Baker. The minutes of the previous meeting were read by the Secretary and upon motion made and seconded, were accepted. The Treasurer presented his report for the previous year, showing receipts of $289.63; expenditures of $238.58, and a balance on hand of $51.05. It was moved, seconded, and carried that the Treasurer's report be accepted. Mr. Herstein reported for the Auditing Committee that the Treasurer's record and annual statement were found in order. Upon motion made and seconded, the Auditors' report was accepted. Upon motion made, seconded, and carried, the reading of the reports of the other committees was dispensed with at this meeting.

Dr. Baker summarized briefly the work of the Chapter for the preceding year, praising the fine work of the Committees, especially that of the Program

Committee. Among suggestions to the Chapter, Dr. Baker recommended that it hold fewer meetings, rather than to impair the strong professional quality of the meetings held. He also suggested that the Chapter stress the national policies in an effort to further the work of the Institute toward professionalizing the chemist.

It was moved and seconded that a vote of thanks be extended to the retiring officers of the Chapter for their efficient service rendered to the Institute as a whole and the New York Chapter in particular. Dr. Baker resigned the chair to Mr. Herstein, who put this motion before the meeting. It was unanimously carried.

Upon resuming the chair, Dr. Baker appointed Dr. Zons and Dr. Snell to serve as tellers of the election ballots. After the balloting, the tellers announced the following new officers elected:

Chairman: B. H. Knight
Vice-Chairman: Jerome Alexander
Secretary-Treasurer: Walter J. Baëza
Representative to
National Council: R. A. Baker
Chapter Councilors: L. W. Bass
J. F. X. Harold
C. D. Ingersoll

Dr. Baker, retiring chairman, resigned the chair to Mr. Knight.

It was moved and seconded that Dr. Baker be appointed to get the opinion of the National Council with regard to some form of insignia for the Institute. This motion was amended to include the presentation to the Council of suggestions for insignia. The motion as amended was carried.

Washington Chapter

The April meeting of the Washington Chapter of The American Institute of Chemists was held at the Bureau of Standards on Friday evening, April 20th, at 7:30 P. M. Chairman A. L. Mehring presided and there was a large attendance of members and guests.

Before the formal meeting, a visit was paid to the laboratory of Dr. Brickwedde at the Bureau of Standards where many things of interest to chemists were observed, including apparatus used in separation of the isotopes of hydrogen.

Dr. Blum and Dr. Emley, of the Bureau, addressed the meeting on ways in which the Bureau of Standards may be of assistance to chemists. James F. Couch, F.A.I.C., gave a talk on the current state of public sentiment toward Government research, pointing out that The American Institute of Chemists was the body which had rendered most concrete service in molding public opinion in favor of government chemists when they most needed help.

Some general discussion followed of the subjects of the addresses and of the plans of the chapter for award of medals and junior memberships in the Institute to honor graduates in chemistry of the Universities in the Washington Section.

Niagara Chapter

The spring meeting of the Niagara Chapter was held at the Touraine Hotel, Buffalo, N. Y. on May 4th. Dr. Howard Post presided in the absence of Chairman W. J. Cotton. The Student Membership Award recently established by the Chapter was presented to Frederick Sievenpiper, a senior at the University of Buffalo.

The election of officers for the coming year resulted in the choice of Arthur J. Norton as Chairman, Charles F. Smith

as Vice-chairman, Howard W. Post as Secretary-treasurer, and Arthur W. Burwell as Chapter Representative. The program at this meeting centered around the protection available to chemists in the way of pensions, insurance, and compensation for accidents. The first speaker was MAJOR C. K. BLATCHLEY, Referee under the New York State compensation law, who discussed the history and workings of the law, and pointed out some interesting cases in his experience. In any establishment where four or more people are employed at manual work all employees fall under the New York law. Farm labor and domestic help are excepted. The law provides compensation for occupational disease or accidental injury or death suffered in the course of employment.

C. F. SMITH presented a report on group insurance for chemists, which was read in his absence by A. J. Norton. Mr. Smith concluded that such a plan is not practical, as the size and nature of a group of chemists does not present an attractive prospect to the insurance companies, and thus there would be no great advantage in reduced rates. It was pointed out that some chemical companies already have welfare plans in effect, which provide for chemists along with other employees. Such arrangements are in the nature of pensions, favorable group insurance contracts, savings plans, etc.

Pennsylvania Chapter

At the April meeting of the Pennsylvania Chapter, HENRY ARNSTEIN spoke on the subject, "The Chemist and the New Deal." "While the repeal of prohibition has been beneficial to the chemist, in its broader aspects the New Deal has not been a success, probably because it has not been conducted by people with practical experience but by dreamers.

"Throughout the world there is an increase in the spirit of nationalism, and practically all nations have curtailed imports, either by tariffs or by doing everything possible to produce commodities which were previously imported from other countries, particularly the United States. The United States, on the other hand, could easily manufacture 85% of the materials it imports. American women have been taught that French and Norwegian sardines are better than domestic sardines, whereas about 80% of the imported sardines are actually caught in American waters. We fail to realize in this country that crops could be chiefly utilized for industrial purposes, and until the American chemist has educated bankers and the government to this fact, the United States will be in hot water. In 1933 we imported petroleum, but we could to better advantage have used corn to produce alcohol for motor fuel. A solution to the problem, which would save the farmer and incidentally make jobs for chemists, would be the maintenance of scientific research institutes by farmers' associations. These would be chiefly engaged in finding outlets for crop surpluses and would easily pay for themselves."

MR. PEASE, of the Philadelphia Technical Service Committee, told of recent developments in the work of the committee. The clerical staff is now paid, which is much more satisfactory than the former volunteer service. Mr. Pease believes that some attention should be paid to a man's previous social status in relief considerations.

NEWS

Howard S. Neiman, F.A.I.C., Secretary of the Institute, addressed the Wilmington Section of the American Chemical Society on May seventeenth. His subject was, "A Chemist as a Patentee."

Philip B. Hawk, F.A.I.C., President of Food Research Laboratories, Inc., of New York City, announces the election of Bernard L. Oser, F.A.I.C., as Director of the organization.

New Officers of the Washington Chapter are: J. W. McBurney, F.A.I.C., *Chairman*, C. W. Whittaker, F.A.I.C., *Vice-chairman*, F. O. Lundstrom, F.A.I.C., *Secretary*, and J. H. Hibben, F.A.I.C., *Treasurer*. Charles E. Monroe, Hon. F.A.I.C., has been unanimously re-elected Honorary President of the Washington Chapter.

On May twenty-fifth a joint meeting of the New York Section, American Chemical Society, Society of Chemical Industry, Electrochemical Society, and Société de Chimie Industrielle was held at The Chemists' Club, New York. J. M. Weiss, F.A.I.C., Chairman of the New York Section, A.C.S., presided at the meeting.

Ross A. Baker, F.A.I.C., Chairman of the Division of Chemical Education of the American Chemical Society, is seeking constructive suggestions regarding the Chemistry Merit Badge requirements and would appreciate receiving the name, address, and name of Council of all Examiners for the Boy Scout Chemistry Merit Badge.

Charles H. Herty, F.A.I.C., Medalist of the Institute, has been awarded the Herty Medal of the Georgia Section of the American Chemical Society. Dr. Herty, a native of Georgia, has devoted much of his life to the development of his native state and of the South. He was for many years Professor of Chemistry at the University of North Carolina and has more recently been an industrial consultant in New York. He is at present Director of the Division of Pulp and Paper Research of the Georgia Department of Forestry.

Foster Dee Snell, F.A.I.C., is sailing for a short European vacation on June sixteenth. Mrs. Snell will accompany him.

Norris W. Matthews, F.A.I.C., has received the degree of Doctor of Science from The American International Academy, which was formed for the purpose of promoting friendly relations between the United States and our Latin-American neighbors. Dr. Matthews informs us that the degree conferred upon him was in recognition of several original publications and of voluntary work performed by him in furthering the work of the Academy.

A. Richard Bliss, Jr., F.A.I.C., Director of the Reelfoot Lake Biological Station, Reelfoot Lake, Tennessee, de-

livered the commencement address on June first, at the Eighty-fourth Annual Commencement of the Cincinnati College of Pharmacy.

New Members

ROBERT JAMES FLETCHER, B.Chem., F.A.I.C., is Director of Research on azo colors at Amalgamated Dye and Chemical Works, Newark, New Jersey. Mr. Fletcher is a graduate of Cornell University and was formerly associated with E. I. du Pont de Nemours & Co. He resides at Irvington, New Jersey.

WILLIAM L. HYDEN, Ph.D., F.A.I.C., is Supervisor of Research for Du Pont Rayon Company at Buffalo, New York. A native of Tennessee, Dr. Hyden was educated at Cumberland University, Lafayette College, and Johns Hopkins University. He specializes in physical, colloidal, and cellulose chemistry and has published several scientific papers on these subjects. Dr. Hyden lives in Kenmore, New York.

HERBERT S. SCHENKER, B.A., A.A.I.C., is Chief Chemist-Physicist for Industrial By-Products Corporation in Philadelphia. Born in Philadelphia, Mr. Schenker is a graduate of the University of Pennsylvania. He specializes in textile chemistry and textile microscopy.

FREDERICK LEROY SIEVENPIPER, B.A., S.A.I.C., graduated this year from the University of Buffalo, and was awarded a Student Membership in the Institute by the Niagara Chapter. Mr. Sievenpiper is a native of New Jersey and resides in Alden, N. Y. He specializes in organic chemistry.

EDITORIAL

(*Continued from page 81*)

public health (as well as his employer's dividends); many researchers in physiological and pathological fields have increased the span of human life, improved our knowledge of nutritional requirements, and contributed much to the defeat of disease.

We are committed to chemical progress. The more complete and thorough we make our education of those who will guide that progress, the more valuable to mankind it will be.

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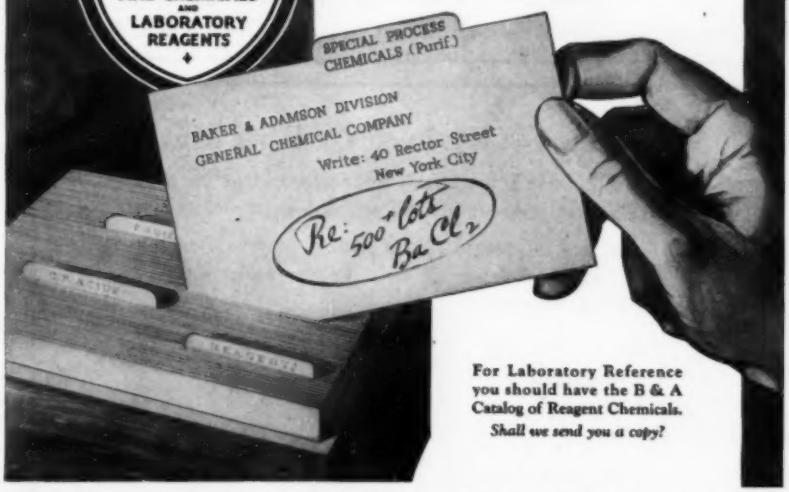

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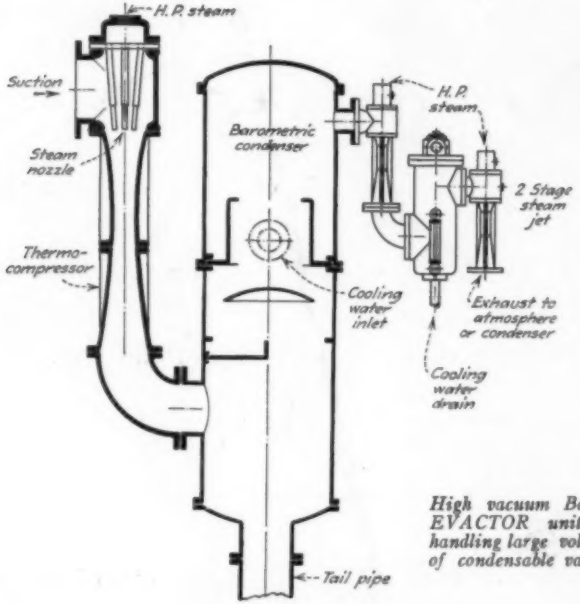

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